

IN THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application.

Listing of the Claims:

1-16. (Cancelled)

17. (Currently amended) A connector for use in making a hollow anastomotic connection between a first aperture in a side wall defined by first and second ends of a tubular graft tissue conduit having interior and exterior surfaces and a second aperture in a side wall defined by first and second ends of a tubular body tissue conduit having interior and exterior surfaces in a patient, the connector comprising:

a structure configured to make the hollow anastomotic connection between the first aperture in the side wall of the graft tissue conduit and the second aperture in the side wall of the tubular body conduit that is substantially annularly continuous but annularly enlargeable about its longitudinal axis, the structure including:

a first portion that includes first and second groups of members, wherein:

the first group of members extends away from the structure,

a distal perimeter is defined by at least the first group of members,

the first group of members is configured to penetrate through the exterior surface of the graft tissue conduit and the interior surface of the graft tissue conduit about the first aperture, and to engage the interior surface of the body tissue conduit about the second aperture, and

the second group of members is configured to engage the exterior surface of the graft tissue conduit about the first aperture; and

a second portion proximal to the first portion, wherein a first spacing is defined between at least the first group of members and the second portion, and wherein the structure is configured to expand from a deformed configuration having a collapsed distal perimeter to an expanded configuration having an expanded distal perimeter,

the first portion and the second portion being joined together to define a plurality of cells each having a medial portion, each cell being joined to an adjacent cell only at the medial portion.

18. (Previously presented) The connector defined in claim 17, wherein the first and second groups of members are substantially radially aligned with respect to a common axis.

19. (Cancelled)

20. (Currently amended) The connector defined in claim 1719, wherein each of the members of the first group has a hook with a sharp end portion ~~for engaging tissue of the interior surface of the body tissue conduit.~~

21-22. (Cancelled)

23. (Currently amended) The connector defined in claim 1722, wherein each of the members of the first group has a barbed end portion.

24. (Currently amended) A connector for use in making a hollow anastomotic connection between a first aperture in a side wall defined by first and second ends of a tubular graft tissue conduit having interior and exterior surfaces and a second aperture in a side wall defined by first and second ends of a tubular body tissue conduit having interior and exterior surfaces in a patient, the connector comprising:

a hollow structure configured to make the hollow anastomotic connection between the first aperture in the side wall of the graft tissue conduit and the second aperture in the side wall of the tubular body conduit that is substantially

annularly continuous but annularly enlargeable about its longitudinal axis and configured for disposition substantially perpendicular to the longitudinal axis of the tubular graft conduit and the tubular body conduit, the structure including:

a distal axial portion that includes first and second groups of members, wherein:

the first group of members extends away from the distal axial portion in an annular array that is substantially concentric with the structure,

a distal perimeter is defined by at least the first group of members,

the first group of members is configured to penetrate through the exterior surface of the graft tissue conduit and the interior surface of the graft tissue conduit about the first aperture, and to engage the interior surface of the body tissue conduit about the second aperture, and

the second, group of members is configured to engage the exterior surface of the graft tissue conduit about the first aperture;

a proximal axial portion, wherein a proximal perimeter is defined by a plurality of second members of the proximal axial portion configured to engage the exterior surface of the body tissue conduit about the second aperture; and

the distal axial portion and the proximal axial portion being joined together to define a plurality of cells each having a medial axial portion located between the distal axial portion and the proximal axial portion, each cell being joined to an adjacent cell only at the medial axial portion;

~~a medial axial portion between the distal axial portion and the proximal axial portion, wherein an axial spacing is defined between at least the first group of members and the plurality of second members, and wherein the structure is configured to expand from a deformed configuration having a~~

collapsed distal perimeter and a first axial spacing to an expanded configuration having an expanded distal perimeter and a second axial spacing.

25. (Original) The connector defined in claim 24, wherein the medial axial portion is configured to extend in a first direction along the exterior of the graft tissue conduit about the first aperture substantially perpendicular to the longitudinal axis of the graft tissue conduit.

26. (Original) The connector defined in claim 24, wherein the distal axial portion is configured to receive tissue of the graft tissue conduit about the first aperture extending up through the hollow interior of the structure in a direction substantially perpendicular to the longitudinal axis of the graft tissue conduit.

27. (Original) The connector defined in claim 24, wherein the collapsed distal perimeter is smaller than the perimeter of the second aperture.

28. (Original) The connector defined in claim 24, wherein the second axial spacing is smaller than the first axial spacing.

29. (Previously presented) The connector defined in claim 24, wherein at least the first group of members and the plurality of second members are configured to resiliently press the graft tissue conduit and the body tissue conduit into annular contact with one another annularly around the first and second apertures.

30. (Original) The connector defined in claim 24, wherein the second axial spacing is substantially equal to the sum of the wall thickness of the graft tissue conduit and the wall thickness of the body tissue conduit.

31. (Previously presented) The connector defined in claim 24, wherein the first and second groups of members are

substantially radially aligned with respect to the longitudinal axis of the structure.

32. (Cancelled)

33. (Currently amended) The connector defined in claim 2432, wherein each of the members of the first group has a hook with a sharp end portion ~~for engaging tissue of the interior surface of the body tissue conduit~~.

34-35. (Cancelled)

36. (Currently amended) The connector defined in claim 2435, wherein each of the members of the first group has a barbed end portion ~~for engaging tissue of the graft tissue conduit and tissue of the interior surface of the body tissue conduit~~.

37-53. (Cancelled)

54. (Currently amended) Apparatus for producing a hollow anastomotic connection between a first aperture in a side wall defined by first and second ends of a graft tissue conduit having interior and exterior surfaces and a second aperture in a side wall defined by first and second ends of a body tissue conduit having interior and exterior surfaces in a patient, comprising:

a connector having a structure configured to make the hollow anastomotic connection between the first aperture in the side wall of the graft tissue conduit and the second aperture in the side wall of the tubular body conduit that is substantially annularly continuous but annularly enlargeable about its longitudinal axis, the structure including:

a first portion that includes first and second groups of members, wherein:

the first group of members extends away from the structure,

a distal perimeter is defined by at least the first group of members,

the first group is configured to penetrate through the exterior surface of the graft tissue conduit and the interior surface of the graft tissue conduit about the first aperture, and to engage the interior surface of the body tissue conduit about the second aperture, and

the second group of members is configured to engage the exterior surface of the graft tissue conduit about the first aperture; and

a second portion proximal to the first portion-group of members, wherein a first spacing is defined between at least the first group of members and the second portion, and wherein the structure is configured to expand from a deformed configuration having a collapsed distal perimeter to an expanded configuration having an expanded distal perimeter; and

the first portion and the second portion being joined together to define a plurality of cells each having a medial portion, each cell being joined to an adjacent cell only at the medial portion;

a delivery tool having a first configuration and a second configuration, wherein the first configuration is configured for retaining a retainable portion of the connector proximal to the first group of members to deform the connector structure from the expanded configuration to the deformed configuration and to advance the collapsed distal perimeter of the connector into the lumen of the body tissue conduit via the second aperture, and wherein the second configuration is configured for releasing the retainable portion of the connector to reform the connector structure from the deformed configuration to the expanded configuration.

55. (Cancelled)

56. (Previously presented) The connector defined in claim 17, wherein the structure of the connector is configured for disposition such that the longitudinal axis of the structure is

substantially perpendicular to the longitudinal axis of the tubular graft conduit and the longitudinal axis of the tubular body conduit.

57. (Previously presented) The apparatus defined in claim 54, wherein the structure of the connector is configured for disposition such that the longitudinal axis of the structure is substantially perpendicular to the longitudinal axis of the tubular graft conduit and the longitudinal axis of the tubular body conduit.

58. (Currently amended) A connector for use in making a hollow anastomotic connection, the connector comprising:

a plurality of hollow cells, ~~wherein the hollow cells are adjoined joined together~~ in an annularly continuous manner, wherein the plurality of hollow cells are annularly enlargeable about a common longitudinal axis, wherein each hollow cell comprises:

first and second midpoints;

a distal portion that includes a top section and a bottom section, wherein:

the bottom section includes a first member extending from the first midpoint towards the top section and a second member extending from the second midpoint towards the top section; and

the top section includes (1) a third member between the first and second members and (2) a fourth member that extends from the third member in a direction away from the third member and the hollow cell; and

a proximal portion joined to the bottom section of the distal portion at the first and second midpoints;

each cell being joined to an adjacent cell only by a connection between the first midpoint of one cell and the second midpoint of the adjacent cell;

wherein a distal perimeter when the hollow cell is in a deformed configuration is defined by the third members of the plurality of hollow cells and a proximal perimeter different from the distal perimeter is defined by end segments of the proximal portions of the plurality of hollow cells.

59. (Previously presented) The connector defined in claim 58, wherein the fourth member of a first of the plurality of hollow cells extends in a direction normal to the third member.

60. (Previously presented) The connector defined in claim 58, wherein the fourth member of a first of the plurality of hollow cells extends in a direction between a normal of the third member and a plane of the first cell.

61. (Previously presented) The connector defined in claim 58, wherein the end segments are oriented in a direction parallel to the third member.

62. (Previously presented) The connector defined in claim 17, wherein when the structure is in the deformed configuration, the distal perimeter is different from a maximum proximal perimeter of the proximal portion.

63. (Previously presented) The connector defined in claim 17, wherein the distal perimeter defined by the first group of members when the structure is in the deformed configuration is different from the distal perimeter defined by the first group of members when the structure is in the expanded configuration.

64. (Previously presented) The connector defined in claim 24, wherein when the structure is in the deformed configuration, the distal perimeter is different from a maximum proximal perimeter of the proximal portion.

65. (Previously presented) The connector defined in claim 24, wherein the distal perimeter defined by the first group of members when the structure is in the deformed configuration is different from the distal perimeter defined by the first group of members when the structure is in the expanded configuration.

66. (New) A connector for use in making a hollow anastomotic connection between a first aperture in a side wall defined by first and second ends of a tubular graft tissue conduit having interior and exterior surfaces and a second aperture in a side wall defined by first and second ends of a tubular body tissue conduit having interior and exterior surfaces in a patient, the connector comprising:

a structure configured to make the hollow anastomotic connection between the first aperture in the side wall of the graft tissue conduit and the second aperture in the side wall of the tubular body conduit that is substantially annularly continuous but annularly enlargeable about its longitudinal axis, the structure including:

a first portion that includes first and second groups of members, wherein:

the first group of members extends away from the structure,

a distal perimeter is defined by at least the first group of members,

the first group of members is configured to penetrate through the exterior surface of the graft tissue conduit and the interior surface of the graft tissue conduit about the first aperture, and to engage the interior surface of the body tissue conduit about the second aperture, and

the second group of members is configured to engage the exterior surface of the graft tissue conduit about the first aperture; and

a second portion proximal to the first portion, wherein a first spacing is defined between at least the first group of members and the second portion, and wherein the structure is configured to expand from a deformed configuration having a collapsed distal perimeter and a substantially conical

shape to an expanded configuration having an expanded distal perimeter.

67. (New) A connector for use in making a hollow anastomotic connection between a first aperture in a side wall defined by first and second ends of a tubular graft tissue conduit having interior and exterior surfaces and a second aperture in a side wall defined by first and second ends of a tubular body tissue conduit having interior and exterior surfaces in a patient, the connector comprising:

a hollow structure configured to make the hollow anastomotic connection between the first aperture in the side wall of the graft tissue conduit and the second aperture in the side wall of the tubular body conduit that is substantially annularly continuous but annularly enlargeable about its longitudinal axis and configured for disposition substantially perpendicular to the longitudinal axis of the tubular graft conduit and the tubular body conduit, the structure including:

a distal axial portion that includes first and second groups of members, wherein:

the first group of members extends away from the distal axial portion in an annular array that is substantially concentric with the structure,

a distal perimeter is defined by at least the first group of members,

the first group of members is configured to penetrate through the exterior surface of the graft tissue conduit and the interior surface of the graft tissue conduit about the first aperture, and to engage the interior surface of the body tissue conduit about the second aperture, and

the second group of members is configured to engage the exterior surface of the graft tissue conduit about the first aperture;

a proximal axial portion, wherein a proximal perimeter is defined by a plurality of second members of the proximal axial portion configured to engage the exterior surface of the body tissue conduit about the second aperture; and

a medial axial portion between the distal axial portion and the proximal axial portion, wherein an axial spacing is defined between at least the first group of members and the plurality of second members, and wherein the structure is configured to expand from a deformed configuration having a collapsed distal perimeter, a first axial spacing, and a substantially conical shape to an expanded configuration having an expanded distal perimeter and a second axial spacing.